METHOD AND APPARATUS FOR FAST NATURAL LOG(*X*) CALCULATION

ABSTRACT OF THE DISCLOSURE

The present invention is, in one embodiment, a method for computing a natural logarithm function that includes steps of: partitioning a mantissa region between 1 and 2 into N equally spaced sub-regions; precomputing centerpoints a_i, of each of the N equally spaced sub-regions, where $i=0,...,N-1$; selecting N sufficiently large so that, within each sub-region, a first degree polynomial in m computes $\log(m)$ to within a preselected degree of accuracy for any m within the sub-region, where m is a mantissa of a binary floating point representation of a number; and computing a value of $\log(x)$ for a binary floating point representation of a particular number x stored in a memory of a computing device utilizing the first degree polynomial in m.

This embodiment of the present invention and others described herein reduce the complexity of approximations used to calculate natural logarithms while achieving numerical accuracy consistent with IEEE floating point precision.

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